

## What is *Anatina anatina*?

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(Five Textfigures)

The generic name *Anatina* (literally, pertaining to a duck) has been applied in molluscan literature to two unrelated bivalve groups that look alike because they have a posterior gape surrounded by an extension of the shell shaped a little like a duck's beak. Lamarck used the French equivalent, "Anatine", as early as 1809, but he did not Latinize it until 1818 (*Hist. Animaux Vertèbres*, vol. 5, p. 462). Tautonymy would fix the type species — *Solen anatinus* Linnaeus, 1758, a nacreous-shelled form related to *Periploma*. In 1817 Schumacher had proposed the name *Anatina* for *Mactra anatina* Spengler, 1802, a mactrid clam with a thin, porcelainous shell. As tautonymy was frowned upon in those days, Schumacher renamed the species *Anatina pellucida* and provided an illustration. Some attempt has been made to rescue Lamarck's usage by dating it from 1816, when Bosc cited *Anatina* Lamarck in proper Latin fashion (*Nouvelle Dictionnaire d'Histoire Naturelle*, vol. 1, p. 492), but this falls short of validation because the only species mentioned, "le solen canard", is a nomen nudum and also in the vernacular. Even if one could salvage Lamarck's *Anatina* in this way, one still would find obstacles preventing its use. Röding in 1798 had proposed the name *Laternula*, which has for type *Solen anatinus* Linnaeus (by subsequent designation of Gray, 1847). Also, *Auriscalpium* Megerle von Mühlfeldt, 1811, is based on the same species. Thus, if the name *Anatina* is to survive at all, it must be as of Schumacher's usage, for a genus in Mactridae. The substitute name *Labiosa* Müller, 1832 (*ex Schmidt MS*), has been favored by some authors, a name proposed when *Anatina* Schumacher was considered homonymous. Letting both uses of *Anatina* lapse and accepting *Labiosa* still would not solve the problem of interpreting the type species, for the type of *Labiosa* necessarily is *Mactra anatina* Spengler. Let us, therefore, examine this form.

*Mactra anatina* was briefly described by Spengler thus: "Testa diaphana, transverse striata, vulva hiante, ano planato." There was

a longer description in Danish but no figure. The length was stated to be  $3\frac{1}{2}$  T, breadth  $2\frac{1}{2}$  T. The shell was said to be a rare form, from South America. Fifteen years later, Schumacher, who lived in Denmark, mentioned in the introduction to his *Essai* (pp. 16-17) that, writing at his residence in the country, he had to rely on his own private collection but that he had opportunity to compare his material with that of Spengler in Copenhagen, especially for such groups as *Mactra*, on which Spengler had published. The implication is, then, that Schumacher's figure of *Anatina pellucida* (see fig. 1a-b) illustrates either Spengler's holotype or a shell very much like it. An inquiry addressed to Dr. Henning Lemche brought the reply that Spengler's material still is in Copenhagen, now at the Universitetets Zoologiske Museum. Dr. Lemche (letter dated April 13, 1961) resolves the problem of identifying the holotype by a tracing of the outline of the shell (see fig. 2) and by quoting the label, which he says is in Mörch's handwriting: "*M. anatina* Spengler/*Anatina pellucida* Sch.: 125. VIII, f. 1. Original." The traced outline compares almost exactly in size and shape to the figure given by Schumacher (length, 41 mm.). It is in the pro-

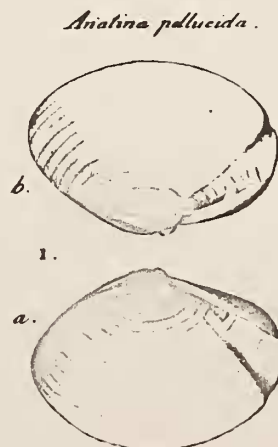


Figure 1: Reproduction of Spengler's original figure of *Anatina pellucida*.

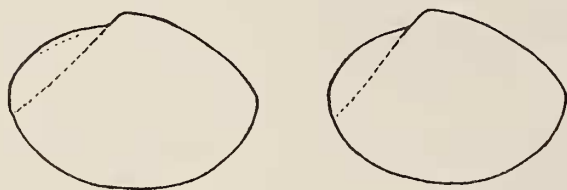


Figure 2: Tracing of outline (courtesy of Dr. H. Lemche) of the holotype of *Anatina anatina* (SPENGLER). Length, 41 mm.

Figure 3: Outline of a shell from Florida of comparable size (Stanford University collection).

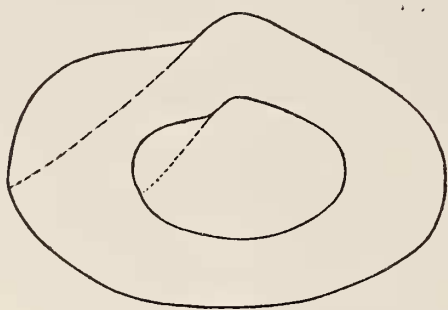


Figure 4 (Inner figure): Outline of right valve, specimen from off Guaymas, Mexico (Stanford University collection). Length, 35 mm.

Figure 5 (Outer figure): Tracing of outline of *Mactra cyprinus*, holotype, as figured by Wilkins, 1957. Length, 70 mm.

portion of  $3\frac{1}{2}$  to  $2\frac{1}{2}$ , and one can thus infer that Spengler's "T" was a measure of length approximately one-half inch long. Spengler's *Mactra anatina* and Schumacher's new name for it seem in the main to have been ignored by other nineteenth century workers. Dall, however, in 1894 (p. 41), without giving evidence for his statement, cited the species as occurring in West Mexico. He listed as synonyms "*Lutraria papyracea* (Lam.) Sowerby, 1824" and *Mactra cyprinus* Wood, 1828. Accepting Dall's identification, I utilized the name *Anatina anatina*, taking as illustration Reeve's excellent figure of Wood's *Mactra cyprinus* (Keen, 1958, p. 159, fig. 363). When first described this latter shell was thought to have come from Peru, but Reeve felt uncertain as to the locality and merely said, "Hab. ---?". It is fortunate

that I overlooked a discussion of the Cracherode collection by Wilkins (1957, p. 164), where the holotype of this form was refigured, with the conclusion that it is conspecific with *Labiosa lineata* (Say) and was actually from the Caribbean. The specimen is in the collection of the British Museum (Natural History) (see fig. 5). It had been purchased in 1797 by the Rev. Cracherode (for whom the abalone *Haliotis cracherodii* was named), having formerly come from the Calonne collection. Wilkins concurred in the judgment of previous British Museum curators, such as E. A. Smith, that the differences in outline between this specimen and a normal *L. lineata* were a matter of relative maturity and also the result of an injury that had given this shell an unusually wide gape — in other words, that the degree of difference could be within the range of variation of the species. Wilkins, of course, had no reason to explore synonymic history prior to 1822, the date of Say's name *lineata*.

So long as no authentically-located West American specimens were available, one had no basis for questioning the conclusions of workers like E. A. Smith, Dall, or Wilkins, even though these conclusions were not in complete agreement. The existence of a problem came to light in the summer of 1960 when three fragmentary specimens of an *Anatina* (two unmatched opposite valves and the upper halves of two matched valves) were dredged by the Ariel Cruise at two stations in the Gulf of California — off Cabo Haro, near Guaymas, depth 15-25 fathoms, and off Carmen Island, 15-20 fathoms. These specimens corresponded almost exactly in size and outline with the illustration of *Anatina anatina* in my book, that figure having been reproduced at approximately one-half the size of Reeve's original. We therefore identified the find on the spot as *Anatina anatina*. Later, when I had returned to Stanford and had compared the specimen with Schumacher's figure, I became increasingly perplexed and now feel obliged to raise the question of whether authors have not been in error as to the synonymies for both the Caribbean and the West Coast species of *Anatina*.

Literature aside, a comparison of 14 available East Coast specimens (for a sample outline, see fig. 3), from Florida and Brazil, with the newly-found West American material reveals the following consistent differences:

## WEST COAST

No radial sculpture, except for the rib bounding the siphonal area

Concentric sculpture weak, fine

Umbones broad, not pointed

Anterior dorsal margin smooth, even

Posterior end longer, 53 percent of total length

Posterior dorsal margin angular

Posterior gape wide

Ventral margin nearly straight

Proportion of height to length, 68 percent

## EAST COAST

Fine radial striae and wrinkles, especially in front of rib

Concentric sculpture apparent, coarse

Umbones narrow, pointed

Anterior dorsal margin flared, set off by a radial depression

Posterior end shorter, 47 percent of length

Posterior dorsal margin curved

Posterior gape moderate

Ventral margin evenly curved

Proportion of height to length, 72 percent

These differences are sufficient to distinguish the two species even if there were no demonstrable geographic separation, being consistent, with little variation among the available specimens. Re-examining the type illustrations one sees that all of the characteristics listed above for the West Coast form are evident in the photograph of the holotype of Mactra cyprinus Wood published by Wilkins. The only real difference between this specimen and the Gulf of California material (see fig. 4, inner outline) is in size, for Wood's specimen is about twice as long as the others which possibly may be juveniles. To my mind, this is good evidence that Wood's specimen came from the West Coast. Whether it was actually from Peru remains to be seen, but surely it must have been from the Panamic province. Support for this argument came while the present paper was in preparation: Olsson (1961) figures a single somewhat broken valve he had collected at Santa Elena, Ecuador. It is 42 mm. long, thus slightly larger than the specimens from the Gulf of California. It exhibits all of the "West Coast" characteristics listed above.

Schumacher's illustration does not show the exterior sculpture, but otherwise all the characteristics cited under "East Coast" above apply to this shell. I would therefore suggest that the following revised synonymy be considered. It represents, of course, a radical departure from established convention. It is offered with a query, in the hope of stimulating further investigations.

Anatina anatina (Spengler, 1802)

Mactra anatina Spengler. Skrifter af Naturh.-Selsk., Bd. 5, Heft 2, p. 126. "South America"; Mörch, 1870. Malak. Bl., vol. 17, p. 124.

Anatina pellucida Schumacher, 1817. Ess. vers test., p. 125, pl. 8, fig. 1.

Lutraria lineata Say, 1822. Jour. Acad. Nat. Sci. Philadelphia, vol. 2, pt. 2, p. 310. Southeastern United States.

Lutraria sp. Sowerby, 1824. Genera of shells, pt. 24, pl. 7. Loc. --? (Compared to but not identified with L. papyracea Lamarck, a composite species).

Mactra recurva Wood, 1828. Index Test., Suppl., p. 4, pl. 1, Mactra, fig. 2. South Carolina.

"Mactra nuttallii Conrad" of Reeve, 1854. Conch. Icon., vol. 8, Mactra, fig. 125 (not of Conrad, which is a Schizothaerus).

Geographic distribution: East Coast of the United States, from New Jersey southward; Gulf of Mexico; northern South America to Brazil.

Anatina cyprinus (Wood, 1828)

Mactra cyprinus Wood. Index Test., Suppl., p. 4, pl. 1, Mactra, fig. 1. "Peru".

——— Reeve, 1854. Conch. Icon., vol. 8, Mactra, sp. 37.

"Labiosa anatina (Spengler)" of Dall, 1894. Nautilus, vol. 8, no. 4, p. 41. "West Coast of Mexico".

——— of Lamy, 1918 (in part). Jour. Conchyl., vol. 63, no. 4, p. 349. (With extensive synonymy and citation of two specimens

in the Paris Museum, presumably from the West Coast but without exact locality.)

"Labiosa lineata (Say)" of Wilkins, 1957. Bull. British Mus. (Nat. Hist.), Historical Series, vol. 1, no. 4, p. 164, pl. 24, fig. 9. (Refigured holotype of Maetra cyprinus.)

"Anatina anatina (Spengler)" of Keen, 1958. Sea Shells of Tropical West America, p. 158, fig. 363. (Reproduction of Reeve's figure.)

"Labiosa anatina (Spengler)" of Olsson, 1961. Mollusca of the Tropical Eastern Pacific, p. 333, pl. 57, figs. 3, 3a. Santa Elena, Ecuador.

Geographic distribution: Gulf of California, from off Guaymas and Carmen Island, to Santa Elena, Ecuador, possibly to Peru.

In a review of Spengler's collection, Mörch (1870) gives evidence that further strengthens the case for Spengler's holotype having been an East American shell as he says that Spengler's principal sources for material were the Danish colonies in the East and West Indies and elsewhere. There were no Danish colonies on the West Coast of the Americas. Of course, Spengler could have purchased imported shells, as did other wealthy collectors. Even if we accept the premise that his holotype was from the East Coast, the puzzle remains as to what collector, prior to 1800, could have found so rare a shell as Anatina cyprinus (and especially so large an individual as the holotype) in Peru or anywhere else along the West Coast. The Calonne collection was worldwide in scope and did contain other rare items from western South America. We must assume, therefore, that some enterprising early sailor conveyed it back to Europe, where it has graced three collections and survived two World Wars.

### Acknowledgment

I wish to thank Dr. Henning Lemche of the University at Copenhagen for his prompt and effective reply to my inquiry about Spengler's type specimens, Dr. Leo G. Hertlein of the California Academy of Sciences for consulting a reference unavailable to me, and my colleagues who have encouraged me to write down these observations instead of merely talking about them. Also, I should not forget to thank the members of the Ariel Cruise, who made the discovery of these specimens in the Gulf of California possible.

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